

# Curriculum Vitae

## Sri Muthu Narayanan Balasubramanian

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### EDUCATION

**B.E, Electrical and Electronics Engineering** **2009-2013**  
College of Engineering Guindy, Anna University, Chennai  
**First Class** with CGPA - 8.2

**Higher Secondary Education** **2007-2009**  
Tamil Nadu Board of Higher Secondary Education  
SRV Boys Higher Secondary School, Namakkal  
**First Class** with **Distinction** (Aggregate of 97.58%)

### WORK EXPERIENCE

**Associate Engineer, Electronics and Systems Integration,** **July '13 till date**  
**Caterpillar Inc.**

Summer Internship at Insystronics Technologies **May '12**

### TEST SCORES

**Graduate Records Examination (GRE)** **Aug '14**  
Quantitative Reasoning: 167    Verbal Reasoning: 162    Analytical Writing: 5.0

**TOEFL (iBT)** **Aug '14**  
Reading: 29    Listening: 30    Speaking: 28    Writing: 30    Total: 117

### PROJECTS

**Primary Display Module Application development (Caterpillar)** **Aug '13 till date**

- Working on Application source code development in Embedded C for Primary Display ECU (Electronic Control Unit) for Articulated Trucks and Motor graders.
- Currently working on implementation of calibration protocol for Motor Graders.

**Data Link simulator for Hardware-In-Loop (HIL) simulations (Caterpillar)** **Jan '14 till date**

- Currently working on the research project in developing customized data link simulator with multiple protocol support (including CAN/J1939 public and proprietary protocols) for HIL simulations during development and testing of ECUs.
- Working on the implementation using Zero Message Queue (ZMQ) high performance asynchronous messaging library.

**Display ECU Test automation (Caterpillar)**

**Dec '13**

- Spearheaded the project for automation of the HIL testing of Display ECUs.
- Onscreen data capture and validation implemented using customized OCR software.
- Test scripts were implemented in Python.

**Condition monitoring and fault diagnosis of Induction motors**

**May '13**

(Undergraduate final year project)

- Sensor data acquisition, Feature extraction, trend analysis and characterization for fault prediction in industrial induction motors.
- Cost effective monitoring and proactive warning system to minimize downtime.
- Secured "S" grade (10/10 points) for the project.

**Rubik's cube solver**

**Dec '12**

(Winter vacation project)

- An autonomous solver that can mechanically solve a 3x3 Rubik's cube.
- Designed and built the setup using three individual 2-DOF servo manipulators.
- The algorithm was implemented using OpenCV on the RaspberryPi board.

**Self adjusting podium microphone**

**Nov '12**

(Winter vacation project)

- Designed and built a low-cost self adjusting podium microphone.
- Implemented the face detection and tracking using Haar cascade filters in OpenCV on the RaspberryPi processor board.

**Automated 3-DOF Robotic Arm**

**Sep '12**

- Dynamic model was created using SIMULINK and the position data for the servo motors were wirelessly transmitted to the Arduino controlled robotic arm.
- The fully automated arm can draw basic shapes and alphabets.

**Tire Pressure Monitoring System**

**May '12**

(Insystronics Technologies, Embedded systems design company)

- Involved in the development of cost effective prototype Tire Pressure Monitoring System for budget cars.
- Worked on sensor data acquisition and indication system design.

**Automated Guided Vehicle**

**Feb '11**

(Funded by CEG Tech forum - the Mega project during Kurukshetra 2011)

- A fully autonomous, self-guided industrial robot for industrial applications.
- Worked on the design of electronics and path planning algorithm.

**Line Follower with vision based obstacle avoidance**

**Oct '10**

(University Grants Commission sponsored project)

- An autonomous line follower robot with camera module for obstacle avoidance.
- Image processing for obstacle avoidance was implemented using MATLAB.

## TECHNICAL SKILLS

Simulation and modeling : MATLAB, Vector tools (CANalyzer/CANoe)  
Programming : Python, C, C++, Java, VBA, Embedded C  
Platforms : Windows, Linux (Ubuntu), WinCE  
Miscellaneous : Pspice, DesignSpark PCB, OpenCV, NI Vision

## AREAS OF INTEREST

- Intelligent Transport systems
- Embedded systems and software
- Robotics, Automation and Computer Vision
- Control systems

## ORGANIZATIONAL ROLES

- Co-founder of Illuminati, a tech hub for spreading technical knowledge through workshops.
- President of The Robotics Club of CEG.
- Student Director at the CEG Tech Forum.
- Secretary of Sruthilaya, the light music orchestra of CEG.

## AWARDS AND ACHIEVEMENTS

- Recipient of Government of India Scholarship throughout under graduate course for ranking among the top 0.1% in the state's high school board exam.
- Ranked in the top 0.02% of TamilNadu Engineering admission applicants in 2009.
- Competitively awarded the sponsorship for a project during second year by The University Grants Commission (UGC).
- Winner of various robotics and circuit debugging contests at National level technical symposiums around the country.

## OTHER SKILLS AND ACTIVITIES

- Holder of **Performer's Certificate**(Grade 7) in **Digital Keyboard**, Trinity College of music, London.
- Trained **6 Sigma Green Belt**.
- Trained in AGILE Mindset and Practices.
- Volunteer at Chinmaya Mission, an international socio-cultural non-profit organization.

## CONTACT INFORMATION

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